CIVL 4111 Design of Structural Systems

**Credit: 6 Points Availability: Semester 1**

Pre-requisite courses:

1) CIVL3110 Structural Analysis  
2) CIVL3111 Structural Steel Design  
3) CIVL3112 Structural Concrete Design

This course includes three sections:  
1) Steel structural systems (Week 1-8 including study break week, 7 weeks)  
2) Concrete structural systems (Week 9-12, 4 weeks)  
3) Composite structural system (Week 13-14, 2 week)

**Week 1 General steel structure design**  
L1 General structural system design  
L2 Wind load  
L3 Earthquake load

**Week 2 Member design**  
L1 Design of members  
L2 Lateral buckling of beams  
L3 Torsional effect

**Week 3 Design of steel Connections**  
L1 Bolt connections  
L2 Weld connections  
L3 Purlins and side rails

**Week 4 Plastic analysis and design**  
L1 Plastic analysis and design 1  
L2 Plastic analysis and design 2  
L3 Examples

**Week 5 Design of girder system**  
L1 Crane girders  
L2 Unstiffed plate girder  
L3 Stiffed plate girder

**Week 6 Design of truss system**  
L1 Truss loading and analysis 1  
L2 Truss loading and analysis 2  
L3 Design examples

**Week 7 Study break (5 April to 11 April)**
Week 8 Design of structural steel frameworks
L1 Unbraced steel frame design
L2 Braced steel frame design
L3 Revision

Week 9 General concrete structure design
L1 General concrete structure design
L2 Continuum beam I
L3 Continuum beam II

Week 10 RC wall, slabs and flooring systems
L1 RC wall
L2 Slab and flooring system I
L3 Slab and flooring system II

Week 11 Prestressed concrete
L1 Prestressed concrete design
L2 Prestressed concrete beam
L3 Prestressed concrete slab

Week 12 Reinforced concrete structure design
L1 Unbraced RC frame system
L2 Braced RC frame system
L2 Design example

Week 13 Steel-concrete composite structures
L1 Steel-concrete composite structures
L2 Composite floor I
L3 Composite floor II

Week 14 Steel-concrete composite structures
L1 Bridge Design I
L2 Bridge Design II
L3 Revision

References:
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Assessment:
1) 20% based on group project
2) 40% mid-term assessment for steel structure design
3) 40% final exam for concrete and composite structure design